

AVIATION WEEK

A McGRAW-HILL PUBLICATION

MAR. 28, 1949



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MACWHYTE "Hi-Fatigue" AIRCRAFT CABLE

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means more uniform
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AN 840 Standard Eye End

AN 842 Standard Fork End

AN 844 Standard Boot End

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AN 846 Bell and Blank

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For exceptional swaging characteristics
Macwhyte "Safe-Lock" Terminals

Macwhyte "Safe-Lock" Cable Terminals are manufactured from a special free-machining grade of stainless steel alloy having excellent swaging characteristics. When properly swaged, they form a bond stronger than the cable itself. "Safe-Lock" Terminals may be ordered loose or attached to cable in complete assemblies... units can be ordered to measurement, ready for installation.

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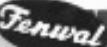


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AVIATION CALENDAR

Apr. 16—Midwest Regional Aviation Maintenance Seminar and 10th Annual Maintenance Seminar, New York, New York.

Apr. 16-Hawker-McDonnell Douglas and Republic announce 10th Annual Hawker-McDonnell Seminar/Cabin Accreditation for August, 1969.

Apr. 18-May 1969: Annual meeting of the Maintenance Assoc., International, Duluth, Minnesota.

Apr. 26-June 1969: Annual aircraft meets, San Ysidro Hotel, Duluth, Minn.

Apr. 30-May 1969: National Aerospace Conference, Marshall Auditorium, Baltimore, Md.

May 1-2—Annual dues of Aircraft Owners Convention, Oklahoma City.

May 15-May 1969: IAE personnel strength meeting, Hotel Asia, Manila.

May 20-May 24—Flight annual maintenance air show and exposition, Grady Field, Jacksonville, Fla.

May 2-4—11th annual foreign manufacturers' exhibition, America's University, Washington, D. C.

May 2-4—Purdue University School of Aeronautics & Transportation conference, Lafayette, Ind.

May 26-JATA traffic conference, Europe.

May 26-JATA technical conference, Indonesia.

May 26-National Fire Protection Assoc. conference on aviation and airport fire protection, Fairmont Hotel, San Francisco, Calif.

May 30-July 1—Industry for Instrumentation, Space America spring meeting, Hotel Statler, Detroit, Mich.

May 31-July 1969: National conference Society of Aerospace Weight Redesign, Hotel Statler, Dayton, Ohio.

June 1-4—Flight annual maintenance air show and exposition, Houston, Texas.

June 2-3—Society annual Maintenance Aircraft, Hotel New York, New York.

June 4-6—Flight annual maintenance air show and exposition, Houston, Texas.

June 7-1969: 10th annual Maintenance Aircraft, Hotel New York, New York.

June 10-12—International conference of Federation Aeronautique Internationale, Music-Park Motor, Cleveland, Ohio.

Sept. 10-1969: AFSC Know-Your-Airplane, Wright-Patterson Air Force Base, Dayton, Ohio.

Sept. 1969: 10th annual aircraft maintenance seminar, Hotel Statler, Boston, Mass.

Sept. 20-21—10th annual aircraft maintenance seminar, Hotel Statler, Boston, Mass.

Sept. 20-21—10th annual aircraft maintenance seminar, Hotel Statler, Boston, Mass.

PICTURE CREDITS

1-L-Dowes, 11-G, 2-Arcus, 12-McCormick, 13-15-Fair Aviation America, 45-Finsen.



HOW TO MEASURE A PUSSYFOOT!

Electric impulses leap across the "scope" of this fantastic balancing machine—as delicate as the footfall of a kitten walking on a steel table two feet away!

To meet unusual critical needs in the cooling and pressurizing of the new supersonic jet airplanes, Allis-Chalmers has perfected a new kind of refrigeration turbine. Heart of this turbine is the fan rotor which operates at speeds in excess of 300,000 rpm. It was to prevent control the manufacture of this rotor to a tolerance of 5 millionths of an inch that Allis-Chalmers designed and constructed the balancing machine shown above.

The ability of Allis-Chalmers not only in design but

to manufacture and test equipment that will stand up under the toughest conditions is the reason the majority of all high-altitude and jet type aircraft produced in the U.S. are Allis-Chalmers equipped.

• Whether your field—Allis-Chalmers engineers—designers and manufacturers of rotors operating in excess of 100,000 rpm—like year-round problems involving high speed wheels. Specialized experience is also available in creating compact turbines and compressors; actuators with high speed return; air, gas and fluid heat exchangers; air pressure, temperature and other automatic controls.

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Engineered to airline standards for

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Corporate Jets • Avionics Test Services • Airlines Auxiliary Services

This is it...the ultimate answer to your aviation radio requirements. Here is a transmitter of maximum weight plus maximum. And a receiver of minimum weight that brings in the signals...through all sorts of weather. Here, we believe, are two of the finest communications units yet designed and built...with no engineering effort spared to make them so.

About the Transmitter AVT-49: This completely self-contained unit delivers 100 watts of power, receive or transmit, over a frequency range of 3.45 to 13 Mc. It provides automatic band change with a choice of four independent power, crystal-controlled frequencies. Weight? Only 62½ pounds, completely installed! Size? One short ATR...for any standard airline rack. Available for either 12- or 24-volt operation. Everything remotely controlled.

About the Receiver AVR-22: The AVR-22 provides continuous tuning over the three frequency bands (one part) in commercial aviation—weather and range [2.50-420 kc], standard broadcast [514-1620 kc], and standard aircraft [2.83-8.07 mc]. In addition, it permits remote switching to any one of four pre-determined crystal-controlled frequencies in the range of 2.83 to 13 mc, plus the stepped carrier frequency of 270 kc. For accurate hearing and position finding, the AVR features a built-in speaker, headphones, and volume modulator. There is also provision for interphone communication and alternate receiver monitoring. Weight? Only 21 pounds. Size? A short one-half ATR...for any standard airline rack. Available for either 12- or 24-volt operation. Complete remote control.

Engineered, refined, and built for operation in a complete system...or individually, these units have passed the type test for CAA certification. Get full information from your RCA Distributor, from Dept. 42B, Aviation Service, RCA, Camden, N.J.

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NEWS DIGEST

DOMESTIC

Consolidated Vultee Aircraft Corp. has changed the name of its subsidiary set up to lease transport planes. New title is Aerleets, Inc., and according to present plans headquarters will be established in Albuquerque, N.M.

Conf. Aeronautics Board ordered five Bellfins and one Interceptor operator (Yellow Cat Co. of Cleveland) to begin service on their certificated routes by July 1. Frederic and Park Air Lines, 51st, Los Angeles; Central Airlines, Oklahoma City; Beacon Turner Aeronautical Corp., Minneapolis; Navy Airplane Co., Inc., Miami, and Arizona Airways, Phoenix.

Fair Office Department announced 31 CAB preliminary certificates that it will not approve Interceptor and Interstar in New York City area. Conference can now associate with route applications proposing service similar to that now authorized for Los Angeles and Chicago.

FINANCIAL

Lockheed Aircraft Corp. reported profit of \$6,739,350 for year ended Dec. 31 at sales of \$175,650,708, of which 75 percent was military, the balance com. interest. Earnings equaled \$5.80 per share. Year-end employment was 15,905 and backlog \$14,530,000.

Douglas Aircraft Co. reported profit of \$5,627,206 for year ended Dec. 31, 1948, on sales of \$108,581,647, earnings equalling \$5.71 a share. Sales were nearly \$18 million under the preceding year. Nov. 30 backlog was \$272,000, up \$31 million from the fiscal 1947 figure. Air Force orders were 91 percent of the total, Navy business, 94 percent.

Republic Aviation Corp. reported profit of \$7,196,471 for year ended Dec. 31 in sales of \$49,816,036. In 1947, company net \$12,579,165 on sales of \$51,710,617. Mar. 1, 1948, backlog was \$12 million.

General Aircraft Engineering Corp. reported profit of \$2,393,311 for year ended Dec. 31 in sales of \$48,631,000. Of the \$182 million backlog as of Dec. 31, \$107 million was unaccomplished contracts and the balance in letters of intent on which company had not yet received verbal contract.

FOREIGN

Bellak jet pilot George Peleg is leaving to fly the B-52 at Ft. Worth in preparation for jet flying the B-57 Electra, which has a span (230 ft.) equal to the B-52 and weighs only 30,000 lb. max (133,000 or 193,000 lb.)

INDUSTRY OBSERVER

► Look for civilian jet racing planes to make their first appearance in the monoplane events of the National Air Races, probably in 1949. Racing pilots and show management appreciate that the war surplus piston-engine fighter competition has gone ahead as far as it can go, and the proposed service to civilian horsepower limitations may be altered again if enough development projects are made sense on small jet powerplants.

► Canadian Ltd., Montreal, is expected to obtain orders for another 10 DC-4 aircraft from British Overseas Airways Corp. to take the place of grounded BOAC Tudor aircraft. While no definite order has been placed yet, options are understood to give the firm considerable time to complete the 12 aircraft. Canadian is now building six BOAC.

► British Air Force is now flying prototypes of two new swept-wing jet fighters. D.5 has one swept-wing fighter in production (F.5/41) and three other fighter flying as experimental models (XP-58, XP-70 and XP-76). The Hunter P.1052 is a swept-wing version of the company's earlier NF.7/46 model and is powered by a single Rolls Royce Nene turboshaft. The supersonic SR.4, another nose-mounted fighter is the swept wing version of the Attacker (Aviation Week, Feb. 19). A new version of the Westland Wyvern powered by a Rolls Royce Sabre turboprop engine is in the frog. The Wyvern was designed as a Royal Navy strike plane.

► De Havilland has made the first entry in a proposed England to New Zealand air race to be held in 1951. Announcements for the race have not yet been completed but are expected to follow general lines of the King-Asia-Australia race of 1934. De Havilland will indicate which of their planes will fly the race after arrangements details are settled.

► Royal Air Force's latest bomber, the Avro Shackleton, made its first flight early in March. Plans was designed for long range reconnaissance functions of the RAF combat command. It is powered by four Griffon piston engines.

► Gnome's Av Hélico helicopter has completed 2 hr 30 min of flight time in addition to 10 hr of running time on the ground. It is now being stripped for structural examination and strengthening of the main boom.

► Bell Aircraft Corp. is getting an additional \$100,000 in subcontract from Boeing on the B-57 jet bomber production project. Bell's latest business will be manufacture of nose section's static and inflation equipment for stabilizer and elevators. Bell also has a licensing subcontract to make jet engine nacelles for the B-47.

► Passed the XH11, these versions of which are now flying, is also a flying model of the XH16 transport helicopter with considerably larger components. The XH16 was originally developed for the U.S. Air Force but has become a joint USAF-Navy project since the helicopter will meet Marine requirements for a new transport type rotary wing aircraft.

► Parts of the Chance-Vought Corsair (XFTU-1) twin jet Navy fighter that disengaged recently on a routine flight near Pensacola, Fla., were found by salvagers in Chesapeake Bay and the frame where the plane was last seen. Neither Navy nor Chance-Vought officials have been able to determine the cause of the crash. Both plane and pilot survived with minor injuries. The fuselage, tail section and engine nacelles were found May 10, 1948. Last known location before Pensacola turned off the tail of a McDonnell Phantom jet but pilot bailed out successfully.

► United Helicopters' initial production of Hiller 360 utility helicopters has reached assembly line proportion at the company's Ft. Worth, Calif., plant, with the final machine nearing completion. First commercial delivery was made last month. At least repeat demonstrators on national tour will be Mason and circuit to the East Coast to New York and Washington. In addition to direct sales, the national tour will produce operating maintenance and data and will enable several thousand grant riders to do the coastwise and have demonstrations of its "airlift" abilities.

Domestic Trunkline Traffic

	Revenue Pmt Miles (Add 800)	Pmt Load Factor	
Carrier	1,181,068	797	1948
American	1,153,808	795,325	56.6
Trans.	153,808	795,616	54.2
United	275,770	794,870	50.0
Coldwell	305,173	793,675	58.5
Continental	38,496	793,555	50.4
Delta	281,164	793,046	52.1
Eastern	96,949	792,949	59.9
United	26,872	792,550	59.0
Mkt Comptn	91,181	791,571	52.8
National	96,412	791,545	50.4
New England	53,895	791,147	53.2
Northwest	132,295	791,075	56.5
Southwest	847,677	791,383	57.9
TWA	1,155,708	791,109	55.4
Western	308,981	791,196	55.0
Total	3,022,546	8,118,626	58.8
(Subtotal Domestic Only)			

Airline Traffic Tops 1948 Levels

Although domestic trunklines are flying more revenue passenger miles, overall deficits are still high.

By Charles Adams

Average passenger load factor for long haul routes fell from 55.67 percent in 1947 to 55.34 percent last year.

After a spectacular safety record and remarkable rise of traffic-pushing traffic such as the first of the week, many firms have pushed domestic trunkline passenger loads consistently above last year's levels.

But nonetheless, the carriers have again started out on the wrong note. Although revenue passenger miles flown by the 16 domestic trunklines increased from 6 percent in January, 1948, over the same 1948 month, traffic figures indicate that overall deficits were still substantial.

► **America, U.S.A., Companys** such as American Airlines and United Air Lines, which made a very poor showing during first quarter 1948 because of DC-4 grounding, achieved large passenger traffic gains in the first two months of this year. TWA and Eastern Air Lines, which benefited from DC-6 grounding last year, found passenger traffic during the last two months of 1948 had dropped considerably.

Final 1948 traffic figures show the 16 domestic trunklines flew 3,022,546,000 revenue passenger miles in scheduled service, about one-half that 7 percent from the 6,036,018,000 miles run in 1947.



CONFIDENT CANADIANS

Confident Canadian Air Forces are apparently anxious that it will get North American F-86 jet fighters during 1949. The development of the F-86 by Republic and liquid-fueled F-100 by Convair Co. of Montreal, are at F-100 licensing agreements.

While revenue passenger mileage declined, total number of passengers flown on domestic trunkline schedules rose from 12,278,056 in 1947 to 12,324,051 in 1948.

► **Fright At New York-Schleswig** domestic freight tonnage reported by domestic trunklines lagged from 35,213,993 in 1947 to 30,709,000 in 1948, as certificate operations took the freight cargo load away from transoceanic shipping lines. Losses therefrom probably offset competition for the last time in the past year period. Mail tonnage rose from 32,778,825 in 1947 to 37,503,651 in 1948, and revenue volume handled by domestic trunklines indeed showed slightly from 26,712,362 ton miles in 1947 to 26,768,883 last year.

In January, 1949, domestic trunklines flew 459,798,000 revenue passenger miles against 394,290,000 in the same 1948 month, when DC-6s were grounded. American Airlines made the largest gains, jumping from 74,000,000 to 99,000,000 revenue passenger miles. United's volume increased from 35,566,000 in January, 1948, to 71,710,000 in January, 1949, and Central, Colonial, Delta, New England and Northwest also gained.

Domestic Air Lines' revenue passenger mileage dropped from 86,327,000 in January, 1948, to 78,936,000 in January, 1949, and TWA's domestic traffic from

64,155,000 to 55,518,000. Mid-west airways firms by the domestic trunkline was up 20 percent in January of this year over the same 1948 month, and freight tonnage gained 35 percent. But an express volume fell 15 percent as considerable business shifted to parcel post.

► **Trans. Continues** in February—Incomplete reports on February traffic indicate it was up ahead of the same 1948 month. United Air Lines already has announced that its domestic trunkline operations will be heavier in 1949 than in 1948. The 16,000,000 ton miles in 1948 of last year's passenger traffic of American, National, Northwest, Colonial and an undetermined over Polaris, 1948 although TWA and probably Eastern continued to lag behind last year's levels.

Meanwhile, a band of CAA and pay orders has wiped out the domestic trunklines' operating deficit for 1948 which at any rate, had still remained to approach the record \$20 million mark, as in 1947. The restrictive pay rules have not only given the industry a small operating profit for 1948 but have forced several million dollars from debt previously reported for 1947.

While the 16 domestic trunklines in a year now show a modest operating profit for 1948, they still have a sizable net deficit. This net may be blamed on the future intracarrier cut-off date of January 1.

► **Europa Lines** Cast-Lagrange brought the sharply slanted deficit reported by American Airlines, the domestic trunklines out their figures 1948, accounting for less than \$4 million against nearly \$5 million in January, 1948. American lost only \$175,000 in January of this year against a \$10,000 deficit operating for the same 1948 month.

Delta and National, which were well in the red during the first month of 1948, showed profits early this year.

► **Flight Report**—U.S. military aircraft operators in Europe during the past winter saw the highest traffic during the past winter was the highest in history. Aided by special extensions from American Overseas Airlines increased its revenue passenger mileage from 7,709,000 in January, 1948, to 18,257,000 in January, 1949. TWA's flew 12,755,000 to 16,988,000, and Pan American Atlantic Airlines doubled from 16,800,000 to 32,936,000.

TWA said that during January, 1949, it earned 26 percent more revenue passenger earnings and 29 percent more net income than in January, 1948. In February the increases were 49 percent and 22 percent respectively. TWA's loss of 10,600,000 in international operations in January, 1948, was cut to \$14,626 in the same month this year.

B-36 Changes Europe's Air Plans

Europeans feel importance of overseas bases to U.S. has lessened, so defense is up to Britain and France.

By Boyd Frame

(McGraw-Hill World News)

PARIS—A growing conviction among many European nations is taking a heavy toll on the capacity of Western Europe against a whole to defend itself successfully. If any member of the Western Union forces would not be part of the conflict early, the advantages of division of production for defense might buckle.

The B-36 is a party responsible for these new shifts. Sir French agrees that way.

The **Statoil** is the key to U.S. grand strategy as it is creating an almost exclusive effort to reduce the importance of ground forces in the overall defense of Western Europe.

Using development of the B-36, the U.S. Air Force had to have bases ranging the Soviet blockade from which to launch its atomic-bombing bombers. It was decided how long each base could be defended from ground attack, but the U.S. could be counted on to make a good attempt at defend

ing these.

Now, according to French strategists, the B-36 could conceivable either become rear centers from Western Hemisphere fields. Therefore, the U.S. air fields in Europe are no longer vital. American strategy, the U.S. can no longer consider an air war as a real field for them.

► **Defined By Europeans**—Many military leaders are becoming convinced that Western Europe must be defended by Europeans if it is to be defended at all. But there are stumbling blocks in the way of Western Europe's defense effort.

National pride makes each country reluctant to sacrifice any part of its armed forces or the war industry to hand them over to the interests of another nation, even if it is a close ally. In the case of the French, national interests, the industrialists, particularly those in the French coalfield, manufacturers of combat aircraft for Western Europe to the most highly developed British aviation industry, the French could then specialize in the manufacture of aerial armament and precision instruments for which, in some cases, it is better adopted than its British counter part.

► **Politics A Factor**—But any forthcoming specification of the last word would be nearly impossible politically in France today. Gaullist and Communist would be too to fight such a negotiation. They could probably only rely

on the support of Marshal Pétain to back them, with appeal to French national pride.

National pride isn't the only stain blighting. Complete military production means taking a heavy gamble on the capacity of Western Europe as a whole to defend itself successfully. If any member of the Western Union forces would not be part of the conflict early, the advantages of division of production for defense might buckle.

The B-36 is a party responsible for these new shifts. Sir French agrees that way.

The British, however, believe that the British Isles are the stronger fortress world over by the Red Army. The Red is the first weak at combat.

The French feel the same way about letting British outposts of Western Europe's fighter aircraft. They point out that the British Isles like Japan are an ideal target for atomic weapons.

The Western countries, satisfied

some amount naturally in placing a defense alliance around themselves, will not be satisfied until and conditions are not as favorable as ever. So even if the French extend the distance of separation to other defense fields, more military strategists have been known to prefer Western Europe will at least know what sort of it will come.

NAA Asks Revival Of USAF Jet Race

Revolving of USAF jet plane plans closed course racing a course with down steep turns was recommended for the 1949 National Air Races at Cleveland, Sept. 11-13, by the National Aviation Association committee.

NAAF officials felt factors closed-course racing as part of the Cleveland race, but just because of the comprehensibility of landing planes and pilots not in the tight closed-course jet Thompson race at Cleveland.

► **NAAF In Bid**—Continuation of Navy jet participation in the Cleveland race country east from the West Coast to Cleveland was recommended for 1949. It was proposed that B-52 planes that from Edwards Dry Lake, 50 mi south of Los Angeles, in particular show for short-distance races in a moderate start. Under this arrangement the first place to cross the finish line at Cleveland would be the winner.

eliminating training base confusion at the south which sometimes provided with the single Beaufort start from Vero Beach, Fla.

A third recommendation is for an inter-service use by National Guard jet planes, something resembling the Alouette Trophy Race run last year by Navy jets between Cleveland and Indianapolis. All recommendations for the new jet competition are subject to confirmation by the National Military Establishment.

• **Steve Thompson**-Thompson Trophy propeller engine race will be run under essentially the same conditions in 1949 as in 1948, on a 15-mile closed course, for 20 laps with virtually no limitations on power.

Competition is still considering a proposed revision of the 1939 Thompson race to limit propellers to 90 cu in displacement which would put the power upper limit down substantially in the 120-130 hp class. This would make the race more a matter of engine design competition.

In the competition, marine fuel is Cleveland, says Roger Weller, Koko, Cactus City, L.I., chairman; Arthur G. Chester, Los Angeles, president of Professional Racing Flying Assoc.; Ben F. Franklin, NRA managing director; Col. Al Boyd, chief of ANAC flight test section, Wright Field, and Charles Logsdon, NAA contest director.



Scale model catalog of Dornier Pelecan shows unique "canard-canard" features.

New Utility Helicopter Being Built

A new utility helicopter, named both in configuration and as an high altitude aircraft, is being manufactured by Dornier Helicopters, Inc., and is expected to be flying in September.

Designated the LTA "Pelecan" by its designer, Claus, manufacturer by its factory, Westerly, R.I., the craft has a gross weight of 1200 lb. and a useful load of 1400 lb. with a 245-lb. Associated Franklin engine. Power loading works out to be 1.75 lb per hp, compared to 1.75 to 1.25 lb per hp for other types of its type.

• **Claus of Germany**-A passenger vehicle, the Dornier Helicopter will have accommodations for five in the after cabin, with provision for one to ride in front. There is no room in the cabin for pilot and copilot seats, giving a "canard-canard" effect.

As a result of this placement of the engine, Dornier claims, there is no problem with center of gravity limit when the craft is lightly loaded or fully loaded as the empennage load is either constant or equal to located outside the center of gravity.

The main compartment measures 7 ft. 2 in. long, 4 ft. 6 in. high by 4 ft. 9 in. wide.

• **Rope Systems**-While new and different from the helocon in most respects, the Dornier is Dornier's latest entry in the rope system. With highly flexible blades rigidly attached to the hub, the rotor ends bearing, dampers and bearings—make possible low-cost production and virtually eliminate vibration.

The rotor head already has been tested for more than a year on a Sikorsky H-1 under an Air Force contract with what the company characterizes as extremely results. Because of this

Dornier anticipates little trouble in obtaining certification of the Pelecan when tests begin in the fall. Company hopes to begin delivery early next year at a price around \$10,000.

Specifications	
Gross weight	1200 lb
Useful load	1400 lb
Engines (parallel)	245 hp
Normal cruise speed	200 mph
Max. speed	15 mph
Cruise speed (75 percent power)	175 mph
Normal range	215 mi
Hanging ceiling (without ground effect)	1500 ft
Service ceiling (at gross wt.)	16,000 ft
Max. rate of descent	45 ft/sec
Tail rotor diameter	5 ft
Passenger length	10 ft. 8 in.

Maintenance Meet

The annual aviation maintenance conference of the Air Transport Assn. last week was expected to attract the largest attendance of its history to the three-day sessions at the Colonial Hotel, Kansas City, Mo. The ten sessions under the general chairmanship of J. E. McNamee, American Airlines, were attended by engineers and maintenance men from all of the 16 trade groups of the nations.

Agenda for the conference was packed with topics and answers by the aviation maintenance departments and only those questions and subjects involving the highest solar were placed in the technical sessions. A change in the organization of the conference was made over previous conferences in that each of the seven discussions in each of the four days followed a similar pattern: a discussion of the present situation in that field, a report on the work done by the department, a report on the work done by the department, and a report on the work done by the department.

The two-day session on

Congressional Roundup

Congress has acted rapidly on major military legislation, but has shown little interest in civil aviation during the first 60 days of the current session.

Following is the status of key measures:

• **70-Group Air Force**-Authorizing legislation, providing for 24,000 aircraft strength and annual procurement of 1000 planes, has passed the House Senate it is expected to pass the Senate.

• **Appropriations**-The 1950 Commerce Department bill, covering Civil Aeronautics Administration, Civil Aviation Board funds is scheduled to be reported out of House Appropriations Committee by mid-April. Budget Bureau recommended a record \$212,800,000 for CAA, \$10,000,000 for CAB. Conference bill to be CAA administrative personnel are likely.

Military establishment appropriations bill also is scheduled to emerge by the House Appropriations Committee by mid-April. Budget Bureau proposed \$40,000,000 for the Air Force. The committee probably will include very little funds for CAA administrative personnel, but is expected to add \$10,000,000,000 to CAA for 1950 for participation in total USAF strength from the 45 groups allowed by Budget Bureau to fit gauge by Budget Bureau to fit gauge.

• **Unification of Defense**-Congress has completed its work on legislation authorizing an "inter arm" in the Services of Defense. Although known as such, the administration will have procedures over the three service areas. This was one of the points in the President's proposed plan of unification in the military was John F. Dulles, president of U.S. Lines, has been mentioned for the post.

• **Reiter Report**-Congress has completed action on an authorization for USAF to construct a radar warning air work to be carried on in conjunction with a similar Canadian program. The measure, HR 116, 318,000,000 for 1950 for fiscal and budget, 300,000 for electronic equipment (USAEP) (already has \$37,200,000 on hand), and \$1,000,000 for other pilot charges.

• **General Motors Planes**-GMC-Airplane division's submission for USAF to enter construction of a guided missile program has been considered by Dulles. One several hundred miles and an estimated range of over 2000 mi. has gained the House. Early Senate approval came earlier. Chairman is estimated at \$300 million for the first three-year development, at \$70 million.

• **National Science Foundation**-Legislation authorizing establishment of a National Science Foundation to conduct and promote basic research in scientific defense and space fields has passed the Senate. Outlook for early

House passage appears to be good.

• **Wind Tunnel**-Authorization for a \$100 million tunnel and experimental wind tunnel construction program is to be reported out of House Appropriations and by the National Military Establishment and National Advisory Committee for Aeronautics, has been introduced in the Senate by Chairman Carl Vinson (D, Ga.) of the Armed Services Committee.

• **Air Reserve**-Several measures to raising the importance of the reserve component of the USAF setup have been pushed. That include bills introduced by Rep. Fred Koford (D, Tex.) and Robert Kitz (D, Wis.) would create an assistant Secretary of Air to receive officer a maximum by Kitz would establish a reserve office in USAF another by Kitz would establish an advisory committee to the Secretary of Air or reserve system, a measure by Rep. James Wix Zwick (R, Pa.) would reinforce continuation of installations for the Air National Guard and the Air Force Reserve.

• **Unification of Defense**-Congress has completed its work on legislation authorizing an "inter arm" in the Services of Defense. Although known as such, the administration will have procedures over the three service areas. This was one of the points in the President's proposed plan of unification in the military was John F. Dulles, president of U.S. Lines, has been mentioned for the post.

• **Transportation Tax**-Although there is strong support in Congress for reducing the surtax of 11 percent to 5 percent, House Ways and Means Committee's chairman, Rep. Robert Doughty (D, N. C.) has given no indication as to whether he plans, now or up with some strong language, will give the same consideration this session. Rep. Joseph Morris (R, Mass.) has predicted they would, along with other taxes for education.

• **Aircraft Safety**-Rep. McClellan (D, N.Y.) has introduced eight bills aimed at speeding up the aircraft construction programs by simplifying procedure and making up financing. They are as follows: by National Aero. of State Aircraft Officials. The \$100 million authorized in the 1948 Airport Act, over a period of years, will not be used up under the program as sharply as expected. It has been kept at a level of approximately \$45 million annually since its inception.

Johnson Pledge

Senate Armed Services Committee approved the nomination of Louis A. Johnson (Aviation) Wm. M. T. (Mac) to be Secretary of Defense on the condition that he sign a written pledge that he has "divorced himself from any association during business with the government."

Johnson informed Congressmen Charles S. Sten, Milwaukee, Tolson (D, Minn.) and the Senate Armed Services Committee Johnson was nominated as Chairman of Comairland Valmet Aircraft Corp., and his law firm had represented Sten, Tolson, Allis-Chalmers with briefs during business in Sten, Tolson, Tolson.

Tolson said the committee had analyzed a statement by Lester P. Tolson, associate P. Tolson, associate employee of the Glenn L. Martin Co., charging that Johnson was succeeded with a large aircraft corporation and stood to gain heavily from his government part. Glenn L. Martin, company president, wrote the committee a strong disavowal of Johnson for the defense part.

The letter head strongly has been noted for more than a year on a Sikorsky H-1 under an Air Force contract with what the company characterizes as extremely results. Because of this

Alison to Leave For Industry Post

John B. Alison will leave his post as Assistant Secretary of Commerce for Aviation and will go to a new corporation formed to develop outer可燃物 cargo containers for commercial and military use.

Alison will become president of the Transair Corp. at Rockwood City, Calif. Transair is a subsidiary of the Hodges Research and Development Corp., Rockwood City, and the North American Car Corp. of Chicago.

Transair will acquire equipment and techniques from the Hodges Corp. for production and handling of ball and dual-celled outer cargo containers designed for interchangeability between aircraft cargo bays and trucks. A similar plan was first adopted by the British Intermodal Association, which has been advanced in "Container Warps," March 21, by George B. Woods, general manager in Undersecretary of the Air Force Arthur S. Benson.

Transair is now headed by Fred L. Anderson, retired USAF general who specialized in bombardment during his military career. Anderson is also president of the Hodges Corp. and will become chairman of the Transair board when Alison becomes president.

Director of Transair is Watson Hodges, president of Hodges Corp. located at Williams M. Sprague division of the house of North American Car Corp.; Arthur L. Gates, former Undersecretary of the Navy; Alvin K. Ingalls, president, Northern Electric Co. Inc.; L. H. S. Reikin, president, North American Car Corp.; Douglas Stuart, vice chairman of the board; Quaker Oats Co.; W. A. Brooks, vice president North American Car Corp.; and Charles Williams, vice president, Hodges Corp.

Alison, a former USAF colonel and fighter pilot, has been assistant to the Undersecretary of Commerce and the administrator of William F. Buckley from that post. C. V. Whitten, formerly Assistant Secretary of the Air Force, was recently named Undersecretary of Commerce.

PRO, PubRel— All The Same Now

Public relations activities of the Air Force, Navy and Army were sharply parceled out a single Office of Public Information for the National Military Establishment last week.

The move was aimed at squelching public animosity of inter-service rivalry which has recently reached a new peak of intensity in the Air Force-Navy feud

over the six-engine Convair B-36B. ▶ Pipe is to be succeeded by the two-man public relations service for the military will be conducted by the one office headed by Wallace Pipe, a former Associated Press reporter and writer at once appointed to the Stevens office of Defense for Public Information.

Pipe's office will pursue the following functions formerly handled by the individual services:

- Press service and news room
- Statuary news and elements of encyclopedias
- Radio and television services
- Photography and news service
- Public relations (public relations and liaison, speakers bureau, press service for public meetings)
- Accreditation of correspondents
- Clerical, reproduction, and distribution of news releases

• The Defense Department's public relations council was established consisting of Pipe and representatives to be appointed by the secretaries of the Air Force, Navy and Army. This council is charged with determining public relations policies to be carried out by the Office of Public Information.

Selection of all press releases and pictures

- Analysis (tagging, news digest, editorial analysis, information research)
- Advisory Council—What will become of the sizable public relations staffs now scattered by the separate services has not yet been made clear except that the new public relations director specifically wants them from performing any of the above functions.

In addition, public relations advisory council was established consisting of Pipe and representatives to be appointed by the secretaries of the Air Force, Navy and Army. This council is charged with determining public relations policies to be carried out by the Office of Public Information.

Neptunes Are Used In Carrier Tests

Now is the time for the Lockheed Neptune (PTV) series of carrier-based bombers in gunnery pits on the experimental program aimed at getting standard data on the use of large mid-range bombers on aircraft carriers.

Experiments with the PTV series are intended to pave the way for operational use of two new types of carrier-based bombers. These two types are the North American AJ-1 powered by two Wright Major piston engines and an Allison J-37 turbojet, and a swept-wing multi-role power bomber still in preliminary design stages. The AJ-1 weighs about 35,000 lb. while the multirole aircraft under study is design weight 40,000 lb. and cost 160,000 lb.

At present, the number of bombers is expected to increase to 2000 in four years' time.

► 8000 Mc. Minnow—Latest exploit of the Neptune series is a carrier takeoff by a PTV-NC with a gross weight of 74,000 lb., including 16,000 lb. of bombs. This PTV-NC flew 2000 nm from the carrier, dropped its bomb load and then flew more than 2000 nm to land at MacDill AFB, Fla., Nov. 26. On Sept. 27, 70,000 lb. of bombs were dropped with 52,000 lb. for the Tropic Tortoise on the deck for its record catapult flight of 11,216 fm from Perthus, Andorra, to Colomiers, Orléans in 1947. The Tortoise carried no bomb load. Aerojet JATO units were used for additional power in both PTV tests.

The PTV performance of nose gear 4000 fm in 20 hr. dropping 30,000 lb. of bombs compares with a recent Air Force B-36 mission in which the bombers carried a record 11,000 lb. for 9000 nm at a 6500 fm. 41 hr. nonstop mission. Navy has yet to load a PTV or similar type plane on a carrier deck. Initial use of such engine bombers as carrier takeoffs was done with the North American B-25.

MULT-STAGE ROCKET FIRED

In the first test of the principle of multi-stage rocketry for penetration in extreme altitudes, the WAC Corporal missile crashed at the nose of the smaller V-2 rocket at a altitude of more than 150 mi., the highest reached by a man-made object. Previous record was only 114 mi., set by V-2 missile alone. At altitude of about 180 mi. and a speed of about 5000 mph, the WAC Corporal in the nose was fired and accelerated to more than 5000 mph and its altitude beyond the Earth's atmosphere. To date this has not been tested. Composite missile was designed and assembled by General Electric Co., California Institute of Tech and Douglas Aircraft Co., under contract with the Army Ordnance Dept. The multi-stage principle now is being incorporated in production rockets.



PRODUCTION

NAA Profit

Net income for fiscal 1948 nears \$7 million after loss in 1947.

North American Aviation Inc. charted back into the black during its 1948 fiscal year, earning net profits of 7 percent of sales in contrast to a net loss for the previous year.

Net profits after payment of \$4 million in Federal income taxes were \$6,779,561 against a \$25,210 net loss for fiscal 1947. North American earned \$1.97 per share on its 34,073 shares of stock.

Income Rate—Total income for the fiscal ending Sept. 30, 1948, was \$82,562,736, an increase of \$7,756,756 over 1947. During the same period company backlog increased by \$47.7 million. Changes in USAF production planning for North American planes delayed the backlog after the end of the fiscal year to \$40.5 million. North American's current backlog is 97 percent military business including future production of 1600 military aircraft for the U.S. Air Force and Navy.

During fiscal 1948 North American delivered 212 military aircraft including its entire order of 150 FIFI II fighters, 100 F-86 Sabre jets, 50 USAF light bombers and 194 other aircraft including F-86A jet fighters, F-86 night fighters and B-50 bombers. More than half of the year's total deliveries were made in the final quarter.

► More Cash—Reflecting the generally improved condition of the company during fiscal 1948, North American had a working capital of \$40,370,067 at the end of the year compared with \$36,689,018 and a cash balance of \$17,407,820 compared with \$12,219,097 the previous year.

North American's production program for fiscal 1949 includes 22 AF-2 aircraft, 100 F-86 Sabre jet fighters and an Allison J-37 aircraft, USAF F-86A jet fighters and the T-28A, USAF trainers and the B-45C powered by Convair Electric J-47 jet engines and 1000 B-50s static aircraft.

During fiscal 1949 North American expanded its plant space by over a million square feet and increased employment from 16,356 to 22,840. Approximately 2000 production contracts were let off after the USAF production cut-off after the end of the fiscal year.

Ryan Report Cites Diversification

Ryan Aeronautical Co., San Diego, reports a sales volume of \$7,946,111 for the 12 months ending Oct. 31, 1947, and earnings of \$536,683 after payment for Federal income taxes for the same period.

Company's 1948 fiscal year started in a great hurry, approximately 50 carts a share of stock, as compared with a net loss of \$527,699 or 10 cents a share for the 1947 fiscal year. Value of unfilled orders and contracts on hand as of the end of the 1948 fiscal year was \$12.7 million.

Analysis of the report in stockholders' meeting by T. Claude Ryan, president, shows that diversified production of commercial and military aircraft and components was responsible for the San Diego firm's good 1948 showing.

Many products were divided as follows:

- Aerospace Division—Approximately 60 percent Ryan aircraft are para-float and mid-engine. Production of the Ryan aircraft and aircraft equipped for aerial photography was continued and increased in scope from the previous year.
- Production was started on large fast-lane turbos for the Boeing C-97 Stratofreighter and the commercial Model 377 Stratocruiser with four prop engines, plus eight prop engines, plus additional planes, was sold during 1949.

► Metal Products Division—A results-oriented dollar dollar market for various aircraft, weapons and accessories for General Electric's J-17 brought to be installed at the newly acquired Lockwood, Ohio, assembly plant, was the main new business taken on by the Metal Products division. Production of exhaust systems and other stainless steel parts for conventional aircraft engines, and production of solar power plants, and parts to other important divisions of the division.

Facilities Army aircraft that guided missile and jet fighter plane production work, as well as production of aircraft parts, with volume in the 1949 fiscal year, with volume of 100,000 jet engine parts, exhaust systems and major aircraft assemblies in a higher rate in 1949. Production of the Navaho will be scheduled to continue closely to market trends as they develop during the year.

Plant Leased

Portion of a government-owned air craft parts plant in Glendale, Calif., has been leased for five years to its wartime operator, the Rohr Aircraft Corp., Glendale, Calif. War Assets Administration supervised.

Rohr is \$532,000 in advance in advance of the plant based on a lease of 13 acres of land and improvements, in making its available with a monthly fixed sum of \$10,000 and \$10,000 per year. The project had an acquisition cost to the government of about \$1 million.

Rohr Aircraft Corp. will use the property to produce certain military equipment for the Department of the Air Force.

WHO'S WHERE

Bell Aircraft Co., Buffalo, N. Y., has announced the resignation of David E. Poulley as sales manager of the helicopter division. He has been with Bell for two years. While not announcing future plans, Poulley says he will remain in the aviation business.

Consolidated Vultee Aircraft Corp., sponsored Harvey C. Clark manager of the Washington, D. C. office. He has been with Consolidated since October, 1946. J. T. Shaw was named Washington representative, reporting to Talc. G. D. Christensen, with Christensen since 1946, was appointed manager of the Dryden office, succeeding O. H. Swindell who resigned. Christensen has been assistant chief engineer at Fort Worth, and he will be succeeded in that post by H. W. Hindley who has been chief project engineer at Fort Worth.



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The difference between W_1 and W_2 is the weight of fuel expended during flight. Since the ratio is the product of the amount of fuel used (W_1) and the average weight in miles per pound, M , the cross-hatched area in Fig. 1 represents the range of the plane.

If the line representing M_{avg} [cross-hatched in Fig. 1] is straight, then average range is half the sum of the initial and final weights. If it is not straight, the same value will be found by other means, simplest of which is the graphical measurement of the area by planimeter.

The resulting area divided by the length of the line representing the fuel load ($W_1 - W_2$) then gives the average height of the diagram and that the mean range. Another method is to obtain the area by integration (area under a curve of instantaneous propulsive force) provided the line is the smooth curve of a function, which it is normally.

By substituting Eq. 10 in Eq. 5,

$$R = \frac{1}{M} \left(\frac{d}{D} \right) \left(\frac{E}{D} \right) \left(\frac{V}{M} \right) r \text{ mi}$$

Breguet's Formula—If the weight of the fuel is treated as a constant of the weight of the plane (W) and Eq. 10 is integrated from W_1 to W_2 , we obtain

$$\begin{aligned} R &= \frac{1}{M} \left(\frac{d}{D} \right) \left(\frac{E}{D} \right) \int_{W_1}^{W_2} \frac{V}{M} dW \\ &= \frac{1}{M} \left(\frac{d}{D} \right) \left(\frac{E}{D} \right) \ln \left(\frac{W_1}{W_2} \right) \\ &\quad - \ln \left(\frac{V}{M} \right) \\ &= \frac{1}{M} \left(\frac{d}{D} \right) \left(\frac{E}{D} \right) \ln \left(\frac{W_1}{W_2} \right) + C \end{aligned}$$

This is the familiar Breguet's range formula and is the algebraic solution for the case represented in Fig. 1. The equation holds true only if the product $\frac{dV}{M} = \frac{d}{D}$ is constant throughout the whole flight as in a pure maximum range flight. The basic general principle involved may be expressed more easily in fact than in words. Although the product dV/dM under some circumstances (such as variations in speed and power settings required by the weather), Eq. 13 is sufficiently accurate for first approximations and is very widely used for this purpose.

Since $P = W_1 - W_2$, then Eq. 13 may be rewritten

$$R = \frac{1}{M} \left(\frac{d}{D} \right) \left(\frac{E}{D} \right) \ln \left(1 + \frac{W_1}{W_2} \right) \quad (14)$$

This, in turn, may be rearranged as

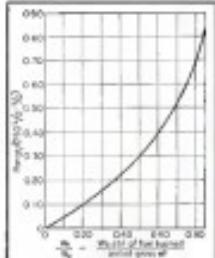
$$\frac{W_1}{W_2} = 1 - \frac{1}{\frac{R}{M}} \left(\frac{D}{d} \right) \left(\frac{E}{d} \right) \quad (15)$$


Fig. 2. Solution of Breguet range formula

This equation gives the amount of fuel required, in terms of percentage of gross weight, to fly a given distance. Fig. 2 gives the results of a series of solutions of that equation.

Using this chart in the graphical solution of Eq. 15, it is possible to make a fairly accurate first estimate of the percentage of gross weight that must be allowed for fuel when the aerodynamic characteristics and the propulsive and engine efficiencies are known.

Figs. 13 and 15 give no indication of the one or weight of the plane that will result if the range is increased indefinitely, only the ratio of fuel weight to gross weight is given.

It is evident that some limit to that ratio must exist. It can never be 100 percent, since the airplane would weigh nothing with no fuel aboard, nor can it be zero, since the plane must carry some fuel. The structure, propellers, engine load and equipment will eat up a considerable portion of the total weight. Therefore, before an estimate can be made of the range of a heavy airplane, it must be known for a given range, what estimates would be made of the weight of these items.

Weight Factor—Cross weight of the plane can be assumed to be made up of

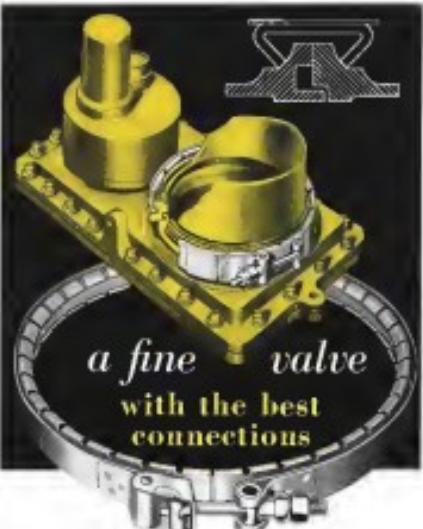
$$H = D_1 + D_2 + D_3 + D_4 + D_5 + D_6 + D_7 + D_8 + D_9 + D_{10}$$

To express each of these quantities as percentages of the gross weight, we divide through by W_1 :

$$1 = \frac{D_1}{W_1} + \frac{D_2}{W_1} + \frac{D_3}{W_1} + \frac{D_4}{W_1} + \frac{D_5}{W_1} + \frac{D_6}{W_1} + \frac{D_7}{W_1} + \frac{D_8}{W_1} + \frac{D_9}{W_1} + \frac{D_{10}}{W_1}$$

$$\left(1 + \frac{D_1}{W_1} \right) + \frac{D_2}{W_1} + \frac{D_3}{W_1} + \frac{D_4}{W_1} + \frac{D_5}{W_1} + \frac{D_6}{W_1} + \frac{D_7}{W_1} + \frac{D_8}{W_1} + \frac{D_9}{W_1} + \frac{D_{10}}{W_1}$$

By considering the air and oil total weight as a fraction of the fuel weight and by arranging terms, this may be written



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$$\frac{W_0 + W_1}{W_0} = 1 - \left[\frac{W_0}{W_1} + \frac{W_1}{W_0} + \frac{W_1}{W_0} \right] \left(1 + \frac{W_0}{W_1} \right) \quad (10)$$

Eqs. 17 and Fig. 2 give a solution for one of the ratios of Eq. 16, W_0/W_1 , and if that ratio can be determined, that formula can be solved. The ratio of the propellant, W_0 , and useful load, W_1 , is specified by the propelling system for any given airplane design, so that when the ratio allowable for these loads is found from Eq. 16, the gross weight is determined.

The percentage structural weight depends upon a number of factors, which cannot be expressed simply. Drag coefficient, wing span, wing thickness and fuselage diameter all affect this ratio. It is probable that the value will be somewhere between 23 and 35 percent.

Combining Eqs. 6 and 9 gives $P = (W_0 V)/(12\pi L_0 D_0)$, therefore

$$\frac{P}{W_0} = \frac{V}{12\pi L_0 D_0} \quad (11)$$

Value $P = W_0/V$ may be obtained from the manufacturer's propeller specifications. Then

$$\frac{W_0}{W_1} = \frac{P}{W_0 + W_1} \quad (12)$$

Since the least percentage of fuel to gross weight will be obtained when L/D is a maximum, this value can be determined from Eq. 11 and inserted in Eq. 10. The value for the speed at maximum L/D may be expressed algebraically as

$$\frac{P}{W_0} = \frac{(1 + \frac{W_0}{W_1})^{1/2}}{12\pi L_0 D_0} \quad (13)$$

Substituting Eqs. 11 and 13 into 15 gives

$$\frac{W_0}{W_1} = \frac{0.447 \times (1 + \frac{W_0}{W_1})^{1/2}}{W_0^2} \quad (14)$$

It will be noted that the value of Eq. 14 depends on the same two variables as Eq. 13, namely the aspect ratio and the propulsive coefficient. It also is influenced directly by the wing loading and indirectly by the air density. This means that an increase in wing loading or an increase in wing altitude creates an increase in the percentage of propulsive weight to gross weight.

All of the quantities in Eq. 14 are found readily except the value of G_{min} , which must be estimated. As a first approximation, this quantity may be assumed proportional to the total external surface area of the airplane and a "cleanness" factor dependent on the aspect ratio. That latter value may be taken as 0.80 for very clean jet aircraft to about 0.006 for the conventional

type using air-cooled piston engines. Therefore,

$$G_{\text{min}} = 0.001 \text{ or } 0.006 \text{ } A_r / S \quad (15)$$

From Eq. 20 an estimate can be made of the power plant propulsive weight required to fly an airplane at its speed for maximum L/D , or greatest range. Then, with the ratio of fuel to gross weight determined from Fig. 2 and the structural weight estimated, it is possible to solve Eq. 15. The effect of oil and landing weight may be accounted for by increasing the fuel percentage 10-15 percent.

It is evident from Eq. 16 that, in terms of the structural, propulsive and fuel ratios, the effect of the percent increase in useful load and propulsive approach area. Since no airplane is built without some equipment and useful load, it is evident that such a design is an impracticality. Referring to Eq. 16 gives

$$\frac{W_0}{W_1} = \frac{P}{1 - \left[\frac{W_0}{W_1} + \frac{W_1}{W_0} + \frac{W_1}{W_0} \left(1 + \frac{W_0}{W_1} \right) \right]} \quad (15)$$

An examination of this mathematical presentation of the statement above demonstrates that as the sum of the structural, propulsive and fuel ratios increase towards unity, the airplane will increase in size very rapidly, thereby becoming incapable of maintaining with an astronomical gross weight.

Since, for any given design, the values of W_0/W_1 and W_1/W_0 will remain substantially constant, Eq. 12 demonstrates the decisive effect the design has on the gross weight of the design. Then, as W_0/W_1 is increased to meet the range requirement, the gross weight is increased precipitously.

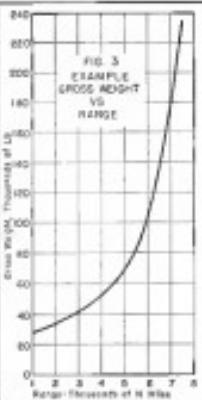
Fig. 3 provides a graphic illustration of these effects. The curve is plotted as a function of the measurable range, defined as the maximum range obtainable during the propulsive combustion.

It is evident that when the range is increased, the gross weight is increased, and vice versa. To illustrate this point, let us consider the case of a propulsive combustion which produces a thrust of 10,000 lb. per second.

$$\frac{P}{W_0} = 1 - \left(\frac{10,000}{12\pi L_0 D_0} \right)^{1/2} = 0.146$$

then the denominator of Eq. 12 equals zero and the gross weight will become infinite, proving the asymptotic nature of the parameter. From Fig. 3, the range is 8640 mi at that condition. This point cannot be shown on Fig. 3 but the great reality with which the gross weight increases in more range is quite apparent.

Fig. 3 and the above mentioned heating range are not given as a table for all airplanes since it is referred to as a propulsive combustion rather than a propulsive system. This example is for illustrative purposes only. However, no matter what values of the various determining quantities are used in the solution, a graph similar to Fig. 3 will be obtained.



Tabulation of Values Assumed in Plotting Fig. 3

$$L_0 = 0.001$$

$$D = 0.001$$

$$L/D_{\text{max}} = 100 \sqrt{\frac{S}{W_0}} = 15.01$$

$$v = 73 \text{ ft/sec.}$$

$$g = 32 \text{ ft/sec.}^2$$

$$s = .90$$

$$a = 10 \text{ ft/sec.}^2$$

$$\frac{W_0}{W_1} = 10$$

$$d = 100 \text{ ft on level}$$

$$\frac{W_1}{W_0} = (0.447 \times 2.0) \left(\frac{73}{15.01} \right)^2$$

$$> 0.6079 \times 1.92 \times 100^4$$

$$= 0.647 \times 1.92 \times 100 \times 10^4$$

$$= 6568$$

$$W_0 + W_1 = 11,000 \text{ lb}$$

$$\left(1 + \frac{W_0}{W_1} \right) \left(1 + \frac{W_1}{W_0} \right) = 1.10$$

$$12\pi L_0 D_0 v^2 = 750 \text{ ft/lb} \times 30.45 \times 90/30$$

$$= 21,200$$

annual radiator, internal JATO units, etc., looking toward advancing these gains both for their increased range and high speed advantages.

Another method for improving the L/D ratio is to increase the wing area. The induced and parasite drag are then reduced by reducing the speed at maximum L/D . However, additional weight of the wings must be calculated carefully to the point where it just begins to affect fuel weight.

• Decrease the ratio of total exposed surface area to wing area—This can be done by enclosing everything possible within the aircraft. For instance, it is necessary to:

• Increase the clearance of the airplane by reducing the factor for surface drag. Lower value for this factor that has been observed in flight test is about 0.003, which applies to very clean aircraft. That was achieved by using extremely thin wings with a smooth surface finish, but such wings usually involve a weight penalty since thicker and heavier wing construction must be used.

• Increase the aspect ratio of the wing—An improvement in this factor can be made but at a sacrifice in wing structural weight. An increase in the factor places greater emphasis on the structural rigidity of the wing. Better loadings of a wing are dependent on the relationship between bending moment and normal stress, and consequently the structural weight of the wing may depend more on torsional rigidity in the fuselage than on bending resistance and load factor.

• Improve the propulsive efficiency—

It is probable that further developments on propellers will naturally change the present conception of propeller efficiency at high speed. It is not possible at present to estimate any specific values that may be obtained.

Improvement in the present 15-50 percent limit of efficiency appear unlikely to be exceeded by a very material amount at moderate speeds. At very high forward speeds, however, it is probable that 70 percent may be the limit.

If a turboprop engine is employed, propeller efficiency can never be better than 50 percent since a full load prop ship will exceed 47-48 percent. Nothing whatever can ever be done to exceed these values and they demonstrate the false impression of turboprop power for very long range.

• Lower the specific fuel consumption. It appears that the best has been reached in present propeller engines but by adding weight to the propulsor in the form of exhaust-driven turbines placed back into the engine, a reduction of 20-25 percent has been estimated. However, this requires a return in thrust as propulsive weight.

The combination of the turboprop and turboring concept may be discussed by assuming no compensation ratio, higher operating temperatures, separable jet exhaust nozzles and auxiliary drives, all of which, however, increase the propulsive weight.

The two turboprop engine types show less entirely different from those of piston engines (AVIATION WEEK, Nov. 15, 1948). Specific fuel consumption decreases sharply as the engine speed increases and decreases more slowly with increase in altitude. From Eq. 19, if the specific fuel economy L/D is to increase, either the wing loading must be increased or the flight must be made at low altitude.

A lower loading results in a lower structural weight percentage but from Eq. 20 the ratio of propulsive weight to gross weight must increase, all other factors being equal.

• Reduce the wing loading. This will reduce the percentage of propulsive weight from Eq. 20 but will increase the structural weight percentage. That is, normally, the wind necessary for better fuel consumption on turbine engines

• Increase the power loading. Power is the most effective single factor in increasing range, since a 10 percent reduction in the power used can double the range. But this device creates certain performance difficulties and doubling of the power loading would double the thrust required, cut the speed 50 percent and reduce the load-cells 55 percent, extremely serious penalties to pay.

• Reduce the rate of engine power to

engine weight. The present propeller designs have reached their lower limit for all practical purposes. The interest and development effort commands agreement in this respect but it is necessary in specific fuel consumption.

• Reduce the percentage of structural weight. This has been slowly decreasing through the years as improved techniques, materials and analysis methods developed. Only assume for a substantial gain at the moment, however, by reducing the design load factor of the aircraft but for this creates great risks of failure due to gear loads, which are already reducing the economy for even relatively long flights in large, high-speed aircraft.

The load factor may be reduced temporarily for safety by lowering the airplane load; however, it is normally reduced until enough fuel has been used up to restore the load factor to its design value.

Other solutions are increasing wing thickness, reducing aspect ratio and increasing wing loading but all of these factors have limited effects on other quantities that should be improved.

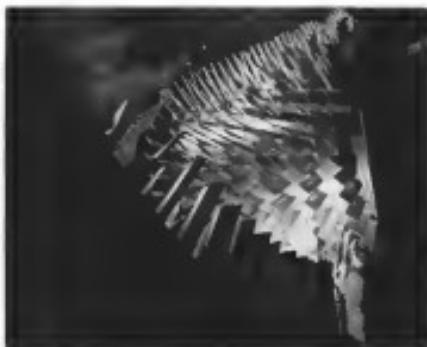
An individually promising as such of these approaches to the problem may appear, no one equals in importance the reduction of the greater airplane dimensions as a means for range increase. All of the previously mentioned gains are

isolated by the assumption that everything else about the airplane is held constant while a single parameter is varied. In actual practice, this is as general.

The individual gains in efficiency, even if they are substantial, have only a minor effect on the range of a given airplane. For example, in a typical aircraft design studied, the airplane range was increased 1 percent by a 1 percent reduction in specific fuel consumption, as a 1 percent reduction in propulsive weight or a 1 percent reduction in structural weight.

Most engineers are convinced that a flight with a 10,000 mi range is technically feasible. But this range can only be attained with an airplane which is considerably oversized and which has a low probability of success. The long a time spent over enemy territory reduces the chance of reaching the target and returning home. The low flying speeds increase the liability of fighter interception.

Actually, the general performance trend is in the opposite direction-towards high performance at a smaller range-and the problem of extending the range of operations will probably be solved only by such means as the use of the newest carrier, location of strategic load bases close to the enemy and flight refueling.



SOURCE OF THE BIG WIND

Key component in expansion of wind tunnel research potential of National Advisory Committee for Aeronautics is the new 100-foot Tunnel, and flow compressor for it a 5-ft supersonic test facility, world's largest, at

WILCOX... first choice of
MID-CONTINENT
AIRLINES



MCA equips entire fleet with
WILCOX 70 channel VHF transmitters and receivers

Mr. Darryl Denault, superintendent of communications for MCA, says: "Wilcox VHF has brought closer the airlines' ultimate goal of all-weather flying — and is doing so it has proved an essential aid to Mid-Continent Airlines in maintaining a perfect safety record dating back to 1934 — and operating efficiency, which in 1948 reached a mark of 98.7% per cent."

"Mid-Continent pilots tell the equipment for the state-free telephone clear" recognition it affords them in plane-to-ground communications in all kinds of weather."

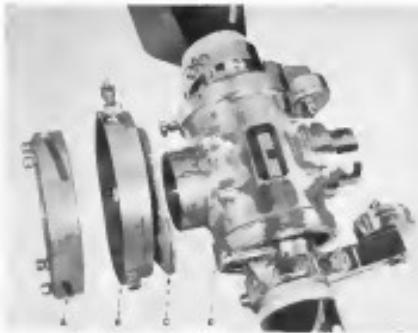
For many years Mid-Continent has used Wilcox ground station transmitters and receivers exclusively. Their proven performance, dependability, and easy maintenance around the globe, independence of operation, proved throughout the system. Thereby Wilcox was first choice radio for MCA's airline communications equipment.

Route Radio...
or complete information on the type data your airline communications system



WILCOX 70 CHANNEL
COMMUNICATIONS SYSTEM
100-1000 MC. SEC.

WILCOX
ELECTRIC COMPANY
KANSAS CITY 1, MISSOURI



Aeromatic's New Altitude Control

Manually selective device affords infinite number of rpm settings. Adaptable to standard models of prop.

A simple enclosed linkage assembly, at the will of the pilot, can automatically operate the Aeromatic propeller by preventing selectivity of engine speed in being fabricated for production models at this time, made by the Propeller Department of Kippes Co., Inc. It may be fitted to all standard models of the prop.

The new manual selector device, designated "State-Crank," consists of two principal parts—a main propeller assembly attached to the engine thrust bearing cover, and a thrust plate housing rotated when pilot operates the control lever.

When the control knob is pushed in, the thrust plate housing moves forward on the case guide, engages the propeller blades and rotates them in a selected higher rpm position. Pulling the knob out disengages rpm by releasing the control from the prop.

Regardless of the control knob's position, normal and axial clutch are engaged with automatic clutch-pitch performance.

The propeller will automatically increase pitch until it is engaged at best climb speed.

During cruise or normal altitude, the automatic operation of the prop can be overridden by the control.

The high-altitude control, the control may be used to maintain rated rpm by the engine's setting. Thereafter, the infinite adjustments provided by the control permit most precise cruise settings.

The tube carries a maximum load of only 18 lb.

Entire assembly weighs about 11 lb., including control cable and attaching parts.

Canada Sponsors University Tunnel

Canadian Department of National Defense has approved a grant of \$350,000 to the University of Toronto for supersonic research. Of this total, \$150,000 is to be used for building modification and the construction of a supersonic wind tunnel capable of Mach 1.6.

The remaining \$100,000 is to be used to cover operating costs over a three-year period.

The tunnel is planned after the German "Koenig" installation, recently placed in operation by the U. S. Navy at White Oak, Md. It consists of a long duct from which air is passed to a test section. When the nozzle is taken a closed air is drawn through the tunnel and into the sphere.

Although this system costs less, testing time is a matter of seconds, it is extremely economical with respect to power.

Shows Jet Vibrations

Amplitude, velocity and acceleration of vibration of the General Electric TG-100 turboprop in flight are being analyzed with the aid of an instrument mounted on the control panel.

This meter, developed at GE's general engineering and consulting laboratory, White Plains, N. Y., is capable of measuring up to 100 vibrations per sec. It defines a small cylinder which converts engine vibration into electrical impulses.

In tests, several of the directors are mounted at engine locations where vibration is most critical. The electrical impulses obtained are amplified and registered on the panel instrument.

High-Heat Oil Tank

A new type oil tank, designed to afford greatly increased safety from fire hazards—particularly in operation of combat aircraft—has been developed by the E. I. du Pont de Nemours & Co., Inc., for the U. S. Navy.

Known to be the first of its kind, the high-resilient container has an outer shell of synthetic rubber combined with other materials and is capable of withstanding a heat of 1800° F. It is also bulletproof.

MONSANTO

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NEW AVIATION PRODUCTS

Oil Cooler Has Novel Tube Joint

Mechanical attachment of core elements permits tube change without removal of cooler from aircraft.

The all-aluminum engine oil cooler has made its place in aviation industry as a lightweight and practical answer for oil temperature regulation.

Two major manufacturers of the aluminum heat exchangers are the Calfornia Mfg. Co., Walnut Creek, Calif., and the Adensco Mfg. Co., Los Angeles.

The Calfornia and Adensco's the standard method of joining core and housing so that the tubes are housed together. However, a patented process of aluminum-tube bonding was originated by the company and affords an extremely light one of unusual strength and resilience in vibration.

This cooler has been selected by the U.S. Air Force for installation in research and culture aircraft. Foreign manufacturers also have chosen it for use on some of their latest planes.

Adensco has, on the other hand, developed a unique joint method of manufacturing the cooler which is used in the field of nuclear construction. Instead of the tube being brazed, a seal is effected between the tubes and header plates by a swaging process.

Many advantages can be derived from the application of this method, although the original cost of the equipment is generally higher than that of conventional joints.



Emergency Impulse Generator

Developed for aircraft use, impulse generators, designed by Spaceliner, Inc., Brooklyn, N.Y., are applicable in many emergencies where normal power is absent or unreliable. An excellent example of use is after detaching explosive charges in piston-driven down, escape hatch, etc. Power is provided by coil-spring motor which drives generator until insulation before release



For Runway Maintenance

Airfield expansion joints on airport runways may be evacuated by a contraption made by San Jose Pipe & Steel Co., 1596 W. San Carlos St., San Jose, Calif., to permit low-cost maintenance of smooth surface. Dennis is powered by 4-hp Wisconsin engine for one man operation, has speed at about 1,500 fpm. It goes to 100 ft. by 200 ft. 700 ft., cable-tipped cutter accommodates joints from 1 to 1½ w. wide, 14 in. deep. Counter-clockwise motion of cutter head tends to pull roadway free of concrete. Airflow is accelerated to ultimate pickup and Dennis has defrosting wheel.

Also important is the fact that railcars which tend to accumulate oil on runways after engine failure, are readily flushed away through the removal of a few tubes, thus preventing the clogging of the assembly—therefore no inspection or cleaning is required.

Although limiting the possibility of corrosion from air, complete film is attained. And the cores have exhibited great resistance to collapsing pressure. Legs start bearing without even 100 psi without tube failure.

The Adensco's cost is stand

and equipment as most major producer of aircraft transports.

by an automatic clutch. Either half of motor can furnish alternate power for generator operation. Unit is activated by flipping side panel cover and striking top lock. For reuse, side locks serve to reveal spring motor and positive signal flag, indicating that mechanism is fully wound and ready.

Rate, Position Gyros

Transistorizing rate gyro reflected by rotational measurements from 10 to 100 deg per sec. and position gyro with one and two axis electrical sensor elements are announced by G. M. Precision Components Inc., 254 West Colfax Avenue, Denver, Colo. gyro accuracy of better than 2°/sec. is an offshoot of solid-state technology. Solid-state products are both hermetically sealed and with 1000, 1500, and 9000 ohm resistance per diode. Other assistance means are also available. Rate gyro offers natural frequencies to 40 cps and are available disassembled or assembled.



Affords Drafting Ease

Dollhouse's chair made by Cannon Products Chair Co., Inc., 1285 Charlotte St., Kansas City, Mo., has seat which may be height-adjusted easily without tools, from 27½ to 31½ in. Seat depth may be adjusted independently and 17½ in. width adjustment provides for both back and frontrest in independently moved and lowered. Seat is also provided with forward-folding mechanism, so that an draftsman leans forward to work on upper part of drawing board, tilting chair permits seat and back to follow his motion.

How STAINLESS STEEL helps insure passenger comfort in the Navy's Lockheed Constitution



In this giant long-range transport plane, the first ever designed and built to Navy specifications, an effort has been spared to make high altitude flying pleasant and comfortable.

Both upper and lower passenger decks of the Constitution are provided with ergonomically placed air outlets from which air is distributed at a maximum 10,000 ft. atmospheric condition, even at 25,000 ft. After efficient through "recirculation" air is provided dual-direction circulation.

The tube which carries the heat from the large aircraft engines, and the liquid duct that serve the heat exchangers that control cabin air, are made of U.S.S. Stainless Steel. This construction provides lighter weight plus high strength, toughness and long life, plus resistance to corrosion and vibration fatigue, and thus insures long-lasting and trouble-free performance of the heating system.

With U.S.S. Stainless Steel the problem of exhaust systems, venting, condensate, air vents, heat exchangers, and jet fans is greatly simplified in addition to obtaining superior service. In structural parts and general surfaces too, U.S.S. Stainless Steel will outperform other materials. Fast fabrication by open-hearth

steel which costs 10 percent more. This lower cost and availability of stainless steel makes it an excellent material for aircraft applications.

Why not take advantage of the many benefits of stainless steel? Write today and tell us your needs. Our engineers will gladly assist you in applying it most economically and efficiently to your designs.



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The NEW Marquette Model 3V Wiper

This new windshield wiper incorporates every feature that is desirable and practical, based on thousands of installations on military, naval and commercial aircraft. It is the result of more than ten years of experience in this highly specialized field.

Blades are synchronized at all times. • Operation in pads of blade will not pull it. Blades may wipe in same or opposed direction. • Blades are packed and locked when wiper is not in use. • Universal drive arm and tie rod require minimum space of parts. • Wiper blades are easily replaced. • Pressure is removed from system when not in operation. • Motor unit may be located at any position in the airplane. Stroke on each window can be varied. • Hydraulic tubing clearance linkage control and provides additional space for mounting other instruments. • Motor arm and window arms are universal, providing maximum interchangeability of parts. • Constant torque values through entire stroke. • Uniform stroke at all speeds. Simplicity of design, resulting in lower first cost and reduced maintenance expense.

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FINANCIAL

CAB Gives Itself More Problems

Its policy statement tells what should be done, but leaves unanswered the big question of how.

In a full census of orders, the Civil Aviation Board recently found a rapidly increasing number which carried messages of hope for some airlines and fears for others.

The non-tariff implications case that certain body or need of body would have thus could justifiably hold by temporary means release payments. While the case is at present under investigation with the Reconstruction Finance Corp., and the Bureau of the Budget handled a more liberal loan policy toward the airlines, the exact picture for such help is yet to be disclosed.

A key feature of the Board's rate action was the reversal of last year's decision not to absorb losses due to the grounding of aircraft. In establishing the principle that such costs are non-negotiable through the mail rate, CAB fixed a sensible amount of \$1 million each for American, United and Pan Am.

► **Deregulation**—It is obvious, however, that many disputes exist in the area of determination and adjustments, particularly following. For example, American had a large number of DC-3s in service that United at the time of the grounding. Traffic demands were higher when TWA's Constellations were in service due to mechanical difficulties. How are these factors to be reconciled? Is it profit going to be allowed on traffic that would have been earned on those grounded planes had they been in service?

These are but a few of the problems involved. Yet this phase is very sensitive because the determinations based on either direction by the Board is a result of its own actions.

► **Rates**. Studies—Various trade associations when their cases do not appear to support costing criteria are asked for a full investigation so that proper adjustments may be made.

The key segments involved are Chicago-Washington now served by Capital, American, TWA and United; Washington-Detroit-Twin Cities operated by Capital and Northwest; and New York-Detroit flown by Capital, United, American and Northwest.

Inquiries in these studies are, they must be viewed in relation to the other investigations launched by the Board in

itself as appraised in the light of forthcoming regulation policies.

A major investigation will appear at the request for the differences in rate pay requirements among the "Big Four" and the smaller carriers, which may differ in part due to communication and sufficient management and to employ unusual action to be taken by the Board or the carriers to eliminate or decrease dependence upon "need" rate payments.

Other moves will examine the cost of the different truck lines of transporting the mail and the factors which determine the fair rate of return on the investment.

► **Carryover Surveys**—Western Airlines and Northwest are both cited for an examination as to how they may best be integrated with the rest of the air transport industry. The solar on Western is interesting in the point of view of its being an entirely new model, whereas that of Northwest is old.

These and other investigations launched by the Board are very sensitive underlining. It is believed that major phases of these surveys have previously been bypassed by the Board without conclusive action. The carrying forward of all of these projects at this time will repair a precarious balance on a staff now under continuous pressure from coast-to-coast proceedings.

Further, all of the carriers involved in these investigations are required to prepare and submit extensive estimates as soon as detailed figures requested by the Board. For example, each carrier is expected to submit figures within 60 days after Feb. 1, 1948, the date of the issuance of the orders. The preparation of such information will represent a costly and time consuming operation extending well beyond the period given.

This plan has its own aspects which require an temporary mail pay relief, are passed to the added cost that the new will be forced to absorb in obtaining materials which, in effect, are expected to show the enormous advantage over the same amount of fuel load, necessary for others in the "Big Four."

► **Contadatory Factors**—The line of in-

quiries being pursued by the Board definitely point to a start of sending the or route patterns of the nation. Yet, contradictory factors are set in motion by avoiding adequate "need" and paying attention to all carriers who are candidates for regulation.

No airline management which is kept alive by strict mail pay is going to be willing to accept reasonable margin terms, to say nothing of being compelled to make a day and day toward greater and greater concessions. This in itself prolongs the status quo of the air transport industry and makes subsequent changes that much more difficult.

An investigation as to the desirability of discontinuing National was an started early last month. Since that day, very little of a conclusive nature has resulted from this survey. With the names in the Western and Northwest cases more clearly defined, it is probable that further proceedings will be greatly simplified.

► **New Airlines**—With this background of opinion, it would be unwise to anticipate immediate action on any far-reaching changes in the composition of the airline field.

Recent news definitely indicates, however, a greater trend toward increased government participation in air-line affairs. While such aid to the form of increased mail pay and loans carry great reliance in the carriers concerned, it is surrounded with undesirable aspects in that the industry will have a tenuous hold on the right to demand greater freedom in the conduct of its business.

It is significant that while Eastern and American appear to have been replaced and, in fact, even provided by newest Board subsidiary airlines, actually they may be the main beneficiaries in the least analysis. Most definitely they will be in the best possible position to least government intervention in the conduct of their operations. Reduced to practical measures this means that remaining on strictly a "Service" basis, Eastern and American may be enabled to develop sufficient earnings with out any particular fear of having the rate of return on the investments reduced through a cut in mail pay rates.

—Sieg Albrecht

Stock Transactions

Recent stock transactions, as reported to the Securities and Exchange Commission:

- To a maximum purchase of 16,000 shares of Industrial Oxygen and Instrument Corp., in January, according to the Securities and Exchange Commission.
- P. D. Quinn, chairman, liquidation of Hisco Industries Inc., holding 1,000 shares.
- H. W. Miller and wife, each of Northrop Corp., sold 100 shares of stock.
- J. W. Myers and wife, each of Northrop Corp., sold 100 shares of stock.
- G. M. Myers and wife, each of Northrop Corp., sold 100 shares of stock.

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Just as during the war, EEMCO has continued its own program of concentration on serving the aircraft industry... performing a specialized design, development, engineering and manufacturing service. Leading aircraft builders have come to us because no one of the more important aircraft of the last decade, and to many more now under development, EEMCO built motors and actuators have solved the very tough problems of: location, power, size, weight, shape, performance, reliability and operation. Let EEMCO solve your problem.

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SALES & SERVICE



Bill Odom sits in his record flight with employees, Walter Booth (left) and Mrs. Booth.

Odom to Stump for Lightplanes

Borch Aircraft Corp. will send pilot around country in attempt to sell the public on personal aircraft.

Borch Aircraft Corp. is looking no further than Bill Odom's Biplane Teacher to help him demonstrate with potential of the personal-type aircraft.

The company plans immediately to visit the pilot around the country as "ambassador" for the lightplane industry in a campaign to sell the public—particularly on the part of private aircraft's ability, dependability, and low cost operation.

Shortly after his record-breaking flight, Odom flew out to Wright Field in map strategy with Booth officials. He will give lectures, arranged in advance by local Borch distributors, to various clubs and business groups in most of the nation's key cities. The pilot has indicated he will work for \$100 a day as a speaker, ready to fly at a time.

► Not忘記Booth's idea of using a pilot who has demonstrated the capabilities of the company's plane to show for the private plane safety is not new.

Piper Aircraft Co. has a similar organization with George Truman who piloted one of the two Piper Super Chiefs in the first lightplane flight in all categories. Based in in TPA's third category for light air planes, those weighing from 2287-5855 lb.

Florida, Georgia, South Carolina, Delaware, and Pennsylvania.

Major difference between Truman's tour and the one Odom will make is that Truman has been going mostly to small groups in the towns, while Odom will concentrate on large audiences in the cities, with special emphasis on business groups.

► Flight Increased Register—According to West Coast dealers, there has been a notable increase in the number of inquiries about the Biplane Teacher since the record-breaking flight.

One of the most important ways in which the flight served the lightplane industry was that it brought to the manufacturer's attention in a spectacular way the relatively low-cost of manufacture of certain type products. Wall Gas for the Biplane Teacher costs only \$5. Odom used 275 gal. for the flight and landed in Tennessee with a mile over 15 gal. in his tanks (Aviation Week, May 14).

There would have been even less if the fuel had not been shifted to assistance of density before filling. This maneuver was suggested and handled by Shell Oil Co., who also increased the fuel supply in this manner for Odom's first attempt earlier this winter.

► Paul Entwistle—As he had no fuel gauge on the 60 gal. wingtip tanks, the pilot had to estimate his fuel consumption during the trip by power settings. Considerable weight savings was gained by removing the Biplane's oil tank in one place so that no room for the fuel flight-tanks 17 gal. to 41 gal. Only four quarts of oil were used for the entire trip.

The equipment items which Odom carried on the first flight but left behind to save weight on his second attempt were cultural navigation equipment and the Odom G-3 emergency rescue transmitter.

All navigation was carried out with Low radio equipment. A Glaser Gel was to be deleted by next flight if the pilot was forced down in the water.

During the week he will do his best to get plane set up again for another flight. Odom has invited a barnstormer to assist him.

Nassau Record

Conquistador was awarded last week by NAA from the Pan Am office of world record status of William Odom's earlier Bonanza flight of 2480.9 mi. from Miami to Odom's Two Ileens Farm (Aviation Week, June 24, 1944), with a record altitude of 18,800 ft. and a single flight of 1600 mi. from Conquistador, a small, isolated, Idaho, to Moscow, Idaho, on a 135 hp three-place Goya monoplane, but their flight apparently has not been officially recognized.

Official notice of second Odom flight is reported by NAA as 4937.24 mi. This is expected to establish a new official record distance record for light aircraft and for nonstop nonstop flight in all categories. Based on in TPA's third category for light air planes, those weighing from 2287-5855 lb.

This week, three out of four entries in Nassau have traveled by air. Last year two flights went by plane.

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All Everett motors are available in six frame sizes—allowing economy because they are designed for quick modifications if the aircraft changes.



Designed for a digital electronic control of the low inertia rotation of a jet engine, this actuator weighs 12 lbs. and will withstand an altitude load of 10,000 pounds without failure.



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To request performance data on a heavy load, low inertia motor or a custom built power package application, write or call Everett's Product Manager. It includes a 1000 or 10000 rpm planetary gear reduction, wind and data packages, and a cooling system. The unit itself can be located on directly the output shaft as listed in the diagram.

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For A.O.C. & E.I.C. power units with mag motor drives and starters, both the 1000 series planetary gears shown above are available in a wide range of sizes, giving you many choices with little or no increase in price.

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BRIEFING FOR DEALERS & DISTRIBUTORS

PLANE-O-TEL—Sunbeam Aerospace Co. is building an "Executive Plane-O-Tel" adding storage facilities for 30 twin-engine executive planes or 30 single-engine craft, at Love Field, Dallas. The \$600-ft by 45-ft office structure is expected to be completed June 3.

BRATTON DEGREE—Bratton Flying Service, Inc., at Lakewood Field, St. Louis, has been authorized by Missouri secretary of state to confer degree of Bachelor of Science in Aeronautical Engineering upon graduates of the two-year Bratton course. Graduates are required to pass tests for CAA airplane and engine mechanics license and private pilot license, in addition to their engineering studies, which include design, material, statics, aerodynamics and materials strength.

OVERHAUL CONTRACTS—Airwork Corp., Newville, N. J., has been awarded contract for engine overhauls for All American Airways for the next year. The company, which specializes in regional routes and is a Pratt & Whitney distributor, also has contracts for overhauls with CAA, TWA, International Airlines, and Colonial Airlines.

REDUCED STOWAGE—Reduced wing loading is helping meet the new four-place Piper Clipper from the usual \$15 to \$12 a pound has been announced by Tim Elbert, president of Salta Flying Service, Teterboro, N. J., because the short-winged Clipper occupies less space and is easier to move in a hangar, he states. Other Piper distributors are expected to offer comparable reductions.

VA DELAYING ACTION—As of Jan. 1, Veterans Administration reports, there were 53,545 GI students in flight training. During the preceding six months VA increased 27,475 applications for flight courses. Less than half of these were approved. The other 34,325 were taken under advisement with respect for better qualification of the vocational nature of the training desired. Up to the first of the year 11,007 of the cases under advisement were still待ing without decision. VA had approved 1512 applications and disapproved 1416. Critics of VA policy point out that the delaying action is an effective means of handicapping the flight program without assuming the costs before Congress of actually rejecting the applications.

779 AGRICULTURAL OPERATIONS—Analysis of statistics supplied to National Aviation Underwriting by CAA and Department of Agriculture shows a total of 779 flight operations in the U.S., or an average of approximately 16 in a state. We are engaged in crop dusting, spraying, seeding or other agricultural aviation activities requiring liaison with various operating interests. California has 96 operators in such activities, Florida is second with 58 operators and Kansas is third, with 47. Other leading states: Iowa, 35; Colorado, 28; and Washington, and Nebraska, 26 each.

CROSSWIND GEAR AGAIN—Goodlyn Aircraft has its crosswind landing gear available now in optional extra equipment on the British Austin Autocar, described as the leading British utility lightplane. British "Flight" magazine reports enthusiastic reception of the "self-adjusting undercarriage," and advises that a small number of sets of components are being made up by Goodlyn. "Just shortly there'll be a large demand," may be made available, possibly at a lower cost.

Current price quoted for the Austin crosswind wheel installation in England is approximately \$300. Sets of the gear in Britain and other export sales, while small individually, will add to general acceptance of the crosswind wheels, and combined volume may make possible large production with resultant economies both for British and American users of the crosswind wheel.

—ALEXANDER MISURELY

America's Greatest Plane Value **PIPER CLIPPER**



A Complete 4 place Plane **\$2995**
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Never in the history of aviation has so much been offered for so little. Piper, always the leader in low-cost practical aircraft, has done it again with the sensational new 4 place Piper Clipper priced at only \$2995.

Here's a limited-space airplane with remarkable performance and lots of roomy comfort—backed by Piper's 16 years of leadership in the light plane field.

Just think of it! Here's a durable airplane with 112 mph cruise, 460 mile range, powered with the famous Lycoming 115 horsepower engine. That's a

whole lot of airplane for less than \$3000.

But the performance is even better than the price. Top speed is 125 mph, full-load rate of climb is 900 feet per minute (over 1300 FTN rated). You've probably never flown a plane with as much "get-up and get-out."

You'll get a new idea of aircraft value, a new idea of personal plane performance—see your nearest Piper dealer for a demonstration.

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AIR TRANSPORT

Skyeoach Expansion Gets CAB OK

Popularity of cut-rate nonscheduled expected to wane as Northwest's transcontinental proposal is approved.

Proposals for sole expansion of the nonscheduled, air-tariff-free continental domestic airways service have received the green light from the Civil Aeronautics Board, thereby putting new threats to airline nonscheduled operations at home to conduct extensive non-tariff-free, nonstop-type services. Industry officials grant the carriers would cooperate in offering service similar to those proposed when they to continue nonscheduled operations.

Northwest Airlines was listed in an envelope the first scheduled transcontinental, round-trip flight late last week with roughly Superseats DC-4 nonstop between New York and Seattle on the Twin Cities and other points. East of 597 one-way connects with the first-class rate of \$2.50.

» More Coach Air Capital Cities

Identify with its proposal of NWA's new Skyeoach operation. CAB authorized Capital Airlines to open up passenger DC-4 coach service between

New York and the Twin Cities and

and Chicago starting April 1. The destination will be on these two routes as Capital's regular New York-Pittsburgh-Chicago "Nightflights" flights—represent a 35 percent reduction from first-class rail rates and higher air fares.

Meanwhile, these rapid for developments marked the skyways' patina:

• TWA, which has been operating transoceanic service between Kansas City and Los Angeles since Feb. 7, and will add CAB for authority to start transatlantic flights between New York and Kansas City starting May 1. TWA was granted permission to increase daily flights of the Kansas City-Los Angeles sky coach traffic from April 30 to July 31 and to extend the service to San Francisco.

Transatlantic flights between New York and Kansas City will be at the same transoceanic level prevailing on the Kansas City-Los Angeles run, but through transoceanic service will not be offered on the transatlantic flights.

• CAB has submitted a preliminary conference for April 4 on regional certificates authorizing transoceanic nonstop-type service. We announced yesterday we already in the runs—Nasco Transoceanic Service, Viking Airlines, Avian Transport Carriers, Seafair and Air Lines, Air America and Transoceanic Airways.

• Independent Sky Coach Systems, Inc., has filed CAB for a certificate entitling it to conduct nonstop transoceanic nonstop-type service between New York and London.

Pan American Airways free using radio telephone to St. John's where start operating on the West Continent this April.

In a letter to members of the Senate and House of Representatives and to the Secretary of Labor and Commerce, Michael J. Quill, president of the Transport Workers Union of America (CIO), which Pan Am radio telephones are affiliated, appealed for a Congressional investigation aimed at looking into radio efforts to "subsidize radio-telephone for radio-telephone doesn't occur spontaneously."

The TWU leader maintained that an increase in telephone rates is necessitated by a desire for greater economy at the expense of efficient and safe operations.

Radio telephones, he asserted, will be the responsibility of the pilot "who is already overburdened by his duties in operating the most complicated craft in commercial aviation."

Quill requested legislation to expand all aircraft on nonstop flights to maximum radio-telephone capacity on a frequency of 500 Hz, the automatically selected channel for distress and emergency communications.

Pan Am officials point out that the airline has been using radio-telephone equipment on the New York-San Juan and New York-Bermuda route for almost 5 years.

They claim this equipment is an improved means of communication which is bound to come into more widespread use for overwater flights and has been used by all domestic airlines for 5 years.



CROWD PLEASER

Getting full measure of publicity at its position at the head of the Statesmen delivery flight, Pan American Airways is displaying its big new planes at its U.S. office

base in the south when one was opened to the public at Miami—an estimated 15,000 residents and visitors turned out to inspect the plane during the twelve exhibition.



LIMATAMBO—With hairy boulders from U.S. design, the outside looks like La Gomera ...



... And the plain, modern, balloon-like interior has a resemblance to Washington National.

New Airports for South America

Several South American countries have been energetically building airports which reportedly are on a par with the best the United States has to offer.

First of the new terminals to open is the Lentiniere airport which at first glance could be easily mistaken for La Guardia terminal. Completely modernized by a team from Lima, Peru, the new airport has had a quantum increase in traffic since its opening last fall and is.

► Also U.S.—The terminal building was designed by Mrs. Pepe Prada, who spent much time studying principles of airports at New York, Washington, and Miami before submitting his own plan.

Lentiniere is operated by CORPAC (Corporación Peruana de Aeropuertos y Aviación Civil), a government agency established in 1945 to improve and manage aviation facilities throughout Peru.

CORPAC also owns 80 other airports, 21 of which are currently being modernized and expanded as part of an overall program.

Most of CORPAC's revenue comes from fuel taxes charged each airline for each liter they burn over Peruvian territory, according to the type of aircraft and.

► For Brasília—They down the rate of all airport facilities plus navigation and communications charges, which charge broken down as follows: 9.7 percent for air-ground voice communication; 32 percent for point-to-point communication; 6 percent for navigation; and 46.5 percent for landing fees.

According to CORPAC's rate scale,

a U.S. carrier operating a DC-6 which makes a scheduled stop at Lima and continues along the west coast of South America would have to pay \$346.74 per flight.

CORPAC also charges a 2 percent tax on behalf of passengers flying over Peruvian territory and domestic additional income from various port revenues.

► Buenos Aires—Argentina's new air-

port, Ezeiza—considered to be one of the finest in the world—is under construction now near Buenos Aires and is expected to be in operation by this spring.

Ezeiza will have two runways capable of supporting 150,000 weight in takeoff and landing. A third runway—1523 ft long—will be able to handle planes twice as heavy as any now in existence.

Airport is designed to accommodate two transports on its aprons at one time and will have twelve gates with corresponding immigration, customs, baggage and police sections. Building available for future expansion is ample. An additional nine gates will be needed for domestic operations.

According to some CAA officials who recently inspected the site, the new airport will be even better than Idlewild. ► Montevideo—Uruguay's next door neighbor, already in achieving most of the facilities recently constructed at Carrasco National Airport, near Montevideo.

For the past few months, international airlines have been using the three 750 ft runways. A fourth runway of approximately the same length will be completed by this summer. New hangars and a terminal building will also be up and running.

Uruguay currently has the finest airport facilities on the east coast of South America.

Foreign Lines Ponder Europe Tourist Fare

International airlines are keeping carefully around Pan American's proposal for a \$400 roundtrip tourist fare to Europe (Aviation Week, Mar. 14).

While foreign carrier officials express the desire for tourist fares, many are quick to point out at the same time that most of the airlines may not be able to operate profitably at such low rates. Some of the problems they see:

► Airlines want Stratocruiser to be able to operate profitably at tourist rates, but carriers responding to the fare cuts have found that such rates won't pay off. Stratocruiser as regular craft won't be standard equipment for all foreign routes in the foreseeable future.

► Because of the different trip plans used, it will be difficult to standardize effects against accommodations, and there might also be a wide discrepancy in first-class arrangements. The analysis, Stratocruiser obviously could offer more in the way of first-class accommodations than the smaller transports.

► IATA members that have been unable to agree on a suitable definition of tourist or first-class service.

► Small carriers, such as Southwest, might be faced with special problems because



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they schedule relatively few flights. ■ **Tourist rates can't be adopted successfully by my airline until IATA members have reached an agreement satisfactory to all.** Any carrier attempting to set up tourist rates independently of the others would obviously be preventing fares from being at par with those of competing air lines.

Monarch Describes Lightning Effects

A stroke of lightning which blinded a DC-3 pilot for three minutes, shattered his windshield and knocked out the plane's radio and all electrical equipment for four hours has been described in a recent report by Monarch Air Lines.

The stricken plane was last left Dec. 14 while flying between Goodfellow and Durango, Calif., at light altitude 11,000 ft. above sea level (1500 ft. above the ground). When the plane was about 300 ft. below the clouds there was which the lightning came. Moderate precipitation started with exceptional sheet five minutes prior to the strike, and lightning was observed five miles away.

■ **Load Explosions**—None of the strikes were reported as being "very load-equal to a firecracker." Although the system was blinded for about three minutes, no serious on-air effect. The first effect was blinded for 30 seconds, with no other effects.

■ **Other Durango Sustained**—Because lightning hit the left windshield, the light was reflected off the left side window, burned through and punctured the skin above the left cockpit, and shattered the static dissipation on the right wing tip and rudder. Engine operation was normal.

While the radio and electrical equipment went out of operation for about five minutes, they subsequently became operative. All equipment functioned normally on the ground check after the landing. No blown fuses, burned wire or other indication of damage to the electrical system could be found.

■ **Centuris Not Affected**—The centuris, a Pansco R-16, suffered from the same type of trouble at 14,000 ft. for about 35 days. However, the damage did not affect the aircraft, nor did the crew reported it lost in it if the plane had experienced moderate to very turbulence at the time of the strike.

The lightning struck just above the plane's compartment off the end of the main deck. The damage evidently carried out the right wing and left the aircraft at the top and starboard discharge ports. An after section of the damage apparently carried down the fuselage section and left the fuselage at the same dissipator as the rudder.



John S. Johnson, Pan American Airways superintendent of training, replaces mechanism that controls

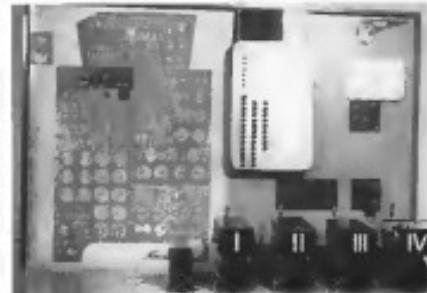
peak of the propeller to two Pan American passengers who are attending class.

Learning About the Stratocruiser

Pan American Airways sets up school for flight crews to study the workings of Boeing's giant transport.

Pan American Airways is going to San Francisco flight and ground crews in intensive training program at its San Francisco base, to show that the Boeing transport's "electronic" control system will be thoroughly understood by crews when the craft goes into service April 1.

Captain, first officer and second officer crews receive 150 hr. of training each; flight engineer, 151 hr., and radio officer 45 hr.

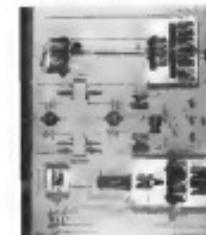


Right engineers here to study the unique control mechanism they graduate.

Nonstandard inventories and methods were used to create problem before



Control system for rudder is diagrammed by the model maker.



Mechanical drive system which operates landing gear is shown in the chart.

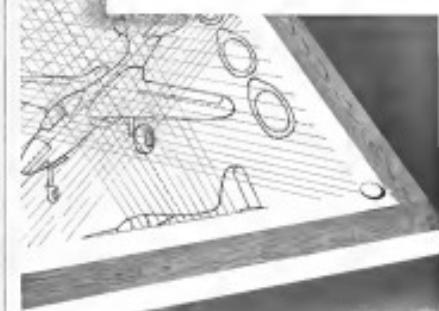


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FASTEST THING IN FASTENERS

Board Upheld on Nonskied Curb

Senate committee backs CAB's right to amend Section 292.1 of Economic Regulations despite protests.

Nonskied airfares had already attempted to exclude Civil Aviation regulations from the new rate-making law operating instructions proposed by the Civil Aviation Board has failed.

After an all-day closed session with CAB members, the Senate Interstate and Foreign Commerce Committee gave the Board the green light to tighten its control over irregular airfares by amending Section 292.1 of the Economic Regulations. That section now gives the irregular fares blanket operating authority.

Under CAB's proposed change, each irregular operator using transport-type equipment would be required to publish its fare for corruption individually. Ticket agency advances would be counted. In view of the committee's action, CAB is expected to adopt the change today.

► **CAB Authority Upheld.**—The Board is within its authority under the 1938 Civil Aeronautics Act, and there is no reason why we should hold up an act until Congress can consider legislation on the irregulars or on any other issues," Senate Johnson's chairman, Sen. Edwin Johnson (D., Colo.), told Aviation Week after the hearing.

Johnson called the meeting after 16 aviation protesters that the Board's proposed change in section 292.1 might impinge on the established industry. Only two of the protesters—representatives Zales Koenig (R., Mo.) and Sen. Homer Cappon (R., Ill.)—showed up for the closed session, however. Sen. William Knowland (R., Calif.), Sen. Arthur Watkins (R., Utah), and Sen. Pat McCloskey (D., N.Y.), in addition to members of the Senate Interstate committee and members of the Board, also attended the hearing.

► **Defense Concurred.**—Nonskied concurred that the outcome of the meeting was a major defeat to those who sought to strip off existing economic regulation. But James Fenton, spokesman for the National Federation of Air Carriers, noted that "we haven't given up yet. There are other committees in Congress we can go to."

Capital Calls For Debenture Tenders

A final call for tenders on its debentures has been issued by Capital Airlines. Openings were made available for the amount of \$1,151,000 ad allowed per year for 1947 and 1948, should improve the financial structure of the company considerably.

Prior to this call, there were \$9,520,000 at debenture outstanding. With the savings made possible by the new plan, Capital can get money in its bank

ing fund. A total of \$1,351,000, representing part and current saving from food recompensation, will be applied toward the issuance of bonds.

Under the present terms of the indenture, company was prohibited from buying bonds in the open market with lower rates prevailing. Selling had not quite satisfied until it paid in April 1, when a total of \$37,300 per \$100 bond was paid for plus a 45-cent annual interest recompensation. A total of \$361,875 was to cover the Apr. 1 interest payment; this has been deposited by the company with the trustee for the debenture to suffice such deduction. Interest Payment.—In addition, the company is anticipating the advent payment of \$17.90 per bond on Oct. 1, 1949.

This is the first time the company has resorted to the tender device to obtain bonds for the paying fund. In previous instances, open market purchases were followed by the total amount of bonds issued being selected used. With the varying amounts of calls available for finding funds previously, however, the company retains the upper hand in that bonds are forced to pay at what price these bonds will be accepted. Tenders will be submitted up until Nov. 4, 1948.

► **Open Market.**

If the bonds are nonredeemable in number and price compared to prevailing quotations, the company then has the option of continuing its operation on the open market. Following passage before that at least \$2 million principal amount of debentures will be issued prior to 1949. This will suffice the company to cover its debenture to less than \$7,500,000 contribution to the capitalization—\$1,000 series and premium.

Estimated amount of financial resources for 1948 also are recorded by the company with the release of its tender schedule. Based on current cash pay allowances, a net income after all charges of \$77,141 was reported for 1945. This compares with an adjusted net loss of \$3,335,000 for the year 1946.

String balance sheet is reported with net assets amount of \$1,058,972 and net worth of \$1,168,603. Including notes payable to the bank of \$3 million, net current liabilities of \$6,044,166 were shown, leaving a net working capital of \$3,994,688.

Civil Aeronautics Board has guaranteed source of final end rate for 1946 to the company which is expected to further improve the outlook for Capital.

FIDO Show

Full-scale demonstration of the first operational FIDO installation has been set for tomorrow (Mar. 29) at Los Angeles Airport.

AVIATION WEEK, March 28, 1949

Labor Amendments Will Affect Airlines

Airline employees would be subject to the minimum wage provisions of the Fair Labor Standards Act, and all but eight flight attendants would receive a 45-cent weekly wage if the amendments to the 1936 Wage-Hour Act approved recently by the House Labor Committee become law.

Estimation of the loss in revenue employees is part of the bill's aim to bring government wage and hour coverage to 600,000 additional workers in various industries which are now exempt under the law.

► **Exemptions Limited.**—The committee, in its report on the bill, stated that its objective is to limit the overtime exemption for employees in transportation to those who cannot practically be brought under the 40-hour week "at the present time."

By extending the minimum wage to airline employees and women, the committee said it was applying 40- or 44-hour work norms. The same wage requirement imposed on competing lines of transportation—air, marine, surface and pipeline.

The 1936 law calls for time and a half pay after 40 hr. a week. That would continue, but the bill would raise the statutory minimum wage from 40 to 75 cents an hour.

Radio Group Formed

(McGraw-Hill World News)

BRUSSELS.—A combined airline and radio network, designed to shorten postwar delays in administrative and traffic messages, has been established by 11 European and American scheduled airlines operating in the continental Europe.

The international telecommunications company, Societe Internationale Telecommunications Aeronautiques, plans to link land and radiotelephones within Europe and with other countries in other hemispheres.

Member companies: SIA (Sweden); DNL (Norway); BIDL (Denmark); BFA, BOAC, BEA (England); KLM (Holland); Sabena (Belgium); Swissair (Switzerland); TWA (USA); and Air France. Each company will pool its existing communications facilities so that all of the group will acquire new means of communication which high costs did not allow previously. Planned at an early meeting by the nine airline experts in each office.

Headquarters of the company is in 102 Rue Royale, Brussels, with administrative office in Paris.

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EDITORIAL

Stunt or Achievement?

Sometimes aviation people let themselves or service competitors give them arguments. We have heard several voices lately about "stunts." Bill Olden's 3000 mi non-stop flight at a Continental-painted Pan American was a stunt. The Air Force's round the world B-50 non-stop flight was a stunt. So it goes.

Now, it seems to us that if there is any group in the world who should appreciate the difference between achievement and a "stunt," it should be those who know most about the business.

If you want to see what the first flight of the Wright Brothers was one of the biggest stunts that could ever use. So here been more other trinkets of flight, if you are in the dispassionate frame of mind. The fact that some of these technical and technological increases will disappear probably may be a temporary source of power to a small company or a credit air service, but we think, in a business with so much public appeal as aviation has, such publicity has genuine value.

We suspect the less lines and the reduced and flat handle that people would give a lot to be able to use the favorable publicity that aviation enjoys every year. And the millions and millions of dollar Congress appropriates for new aircraft is not without public approval, you can be sure. So, thank goodness and aviation achievement for use of those dollars. And another thing, would you rather have an epidemic of small headlines about a "stunt" like Bill Olden's as about a "flying miles each?"

We think there's a whole lot of a difference between achievement and stunts—that if you are going to keep on selling them, make when you do it, please.

Which Will You Bet On?

Here's a study in contrasts:

(1) Pan American, now taking delivery on 10 giant Boeing Stratocruisers, gives notice through its aggressive President Juan Trippe that it looks ahead to the time not long distant when it can provide low-cost fares to Europe, the Orient and South America, with perhaps a tourist class fare in Europe at something like \$125, contrasting with a recent winter excursion rate of \$446. The same airline has piled up suitable experience running 61 passenger DC-4s between New York and Puerto Rico, and the results it extended coach service to Rio de Janeiro and Buenos Aires.

Says Mr. Trippe: "The people won't forget miles or service, and it is here to stay."

(2) United Air Lines, also soon to take delivery on a fleet of giant Stratocruisers, has displayed through its President W. A. Patterson, that it does not believe in the no-coach type of operation, and has no intention of instituting it

United is probably the outstanding example of those who contend air transportation should be restricted to one-class luxury service, complete to full coach meals.

It is a neat trick if they can do it, but we think United is dead wrong. We think Pan American is both able and right. We shall watch with keen interest how United flies its big new transports without any fare cuts, while Northwest and TWA are energetically carrying across the country with special coach planes, several hours slower, perhaps, but much dollars cheaper. And if American doesn't enter this coach plateau before long we will abandon all attempts at fare cutting.

Air transportation will never become mass transportation until the masses can afford to use it. Until the masses fly we haven't a ghost of a chance of reducing government regulation. Unfortunately, some industry people seem to have not the slightest concern in cutting down regulation. They still argue any new competition, such as the Douglas, which might show up any of their current operations is unnecessarily high or which might cut up a product of efficiency. They prefer inefficiency because it pays off better.

There are birds nests, but it is difficult to see how much longer we can afford to shovel out subsidies with one hand, while holding off with the other hand all new competition which demands an opportunity to show what it can do cheaper and more efficiently. Public opinion surely is going to bring a change.

We think United, and in school of instruction rather than growth, has made an honest mistake. We also predict that UAL will have a lower fare schedule well within six months. In other words, our bet is on Pan American.

New Services to Readers

Anavite Wires appreciates the many letters of comment which have reached us at Yearbook, Edition Feb. 25. An inventory of U. S. Air Power, in publication last week of the Magazine Air Transport Facts & Figures with a comprehensive summary of the status of aircraft, and our newly issued folder introduced on Mar. 7, reporting 2604 Air Force contracts awards to industry.

These are concrete examples of an aggressive expansion in Anavite Wires' editorial service to its readers. Other news, features and services are contemplated, and will appear throughout the year.

We are grateful to you for a constantly growing number of letters, and hope you will continue writing. Constructive criticism and comments are often most enlightening and helpful than those of praise. If there is any way Aviation Wires can be made more valuable to you and your business why not drop us a line at 330 W. 42 St., New York, N.Y., and tell us how?

ROBERT H. WOOD

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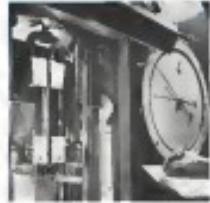
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Tommy was in on the design and production of the first turbojet engine in the United States—the General Electric IA. Tommy worked with England's Whittle, Air Force officers, airframe manufacturers, and expert design men like Sam Puffer and D. F. "Truly" Warner. He supervised the installation of the historic IA engine and saw it grow from a plan to practical, powerful reality.

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